12 March 1981

MEMORANDUM FOR: [redacted] STAT
4C Project Leader

FROM: [redacted] STAT
Chief, Engineering Division, ODP

SUBJECT: 4C Availability

1. Attached is the result of our analysis of the expected availability of the proposed 4C computer system [redacted] STAT
[redacted] Our availability model predicts a long-term STAT
average availability of 94.77 percent. I would suggest that you take a conservative position and plan on a 94 percent availability for the system in your official documents due to the uncertainties [redacted] STAT

2. Since 4C will not have a totally redundant system or on site customer engineers, a two-hour response time was included in the down time estimate for those components of the system that are not redundant. If the system [redacted] STAT
[redacted] had on site customer engineers, which is very expensive, we STAT
estimate that the availability would go from 94.77 percent to STAT
about 96 percent.

[redacted]

Attachment: A/S

Distribution:
Orig - Addressee
1 - D/ODP (w/attachment)
1 - DD/ODP (w/attachment)
1 - DD/P/ODP (w/attachment)
1 - C/SPD/ODP (w/attachment)
1 - [redacted]ED/ODP (w/attachment) STAT
5 - Chronos (w/attachment)

9 March 1981

MEMORANDUM FOR: Chief, Engineering Division, ODP

FROM : [redacted] STAT
Chief, Maintenance Management Branch,
Engineering Division, ODP

SUBJECT : 4-C's System Availability Study

This study was prepared to determine a configuration that would provide the best availability for the 4-C's system. The source data for the study was extracted from Engineering Division's problem data base and reflects the failures encountered during a typical 90 day period. The information extracted represents a 5 September thru 5 December 1980 timeframe. The results of the study is that the 4-C's system, hardware and software, will maintain an average availability of 94.77%. The following is a description of the input used, by subsystem, for the attached model.

1) IBM 158 SUBSYSTEM

Subsystem consists of the IBM 370/158 CPU, IBM channels and CDC memory. Data was extracted from the TPNIPS, TPSTAR and TADS System Availability File. Data was summed and averaged for one composite value. CPU - one incident for 20 minutes + 120 minutes of vendor response time = 140 minutes. IBM channels did not have incidents contributing to the loss of availability on the above systems for the past year. A 100% of availability was included in the calculation of the composite value. CDC memory also had no incidents contributing to the loss of availability. A 100% of availability was also used.

During the past two years, the running Mean Time Between Failure (MTBF) of the IBM Channels is 11,057 hours and the CDC Memory is 7,180 hours. Availability for these two equipments are 99.3 and 99.9% respectfully. For this model zero incidents with zero downtime was used.

SUBJECT: 4-C's System Availability Study

2) MVS

Data for the MVS Subsystem was extracted from the GIM Production System Availability File. There were four incidents with a total downtime of 66 minutes.

3) APPLICATIONS SOFTWARE

Data was extracted from the GIMPROD Availability File. For the 90 day period, there were four incidents for a total downtime of 82 minutes.

4) IBM 3330-II DISK SUBSYSTEM

The Subsystem consist of both controllers and drives. Data was extracted from the Problem/Action data base. The data was normalized and adjusted to reflect the ten hour scheduled uptime. One hundred twenty minutes were added to each error or problem. The resultant figure used was one incident with 210 minutes of downtime.

5) COMTEN

Data was extracted identically as explained for the IBM 3330-II Disk Drives. Resultant figure used was one incident for 364 minutes. (120 minutes response was included).

6) COMMUNICATIONS LINES

Data was provided by the Commo Division. Data was normalized for a ten hour scheduled uptime. The resultant figure used was eight incidents for 520 minutes of downtime.

7) IBM TAPE SUBSYSTEM

The Subsystem consist of both tape controllers and tape drives. Data was extracted from the GIMPROD System Availability File and averaged together. There was one incident for a total downtime of 128 minutes (120 minutes response time was included).

8) POWER

Data was extracted from the GIMPROD System Availability File and was reviewed by [redacted] of CEMB for reasonableness. The figure used was one incident for a total of 246 minutes downtime.

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SUBJECT: 4-C's System Availability Study

9) PROCEDURAL

Data was extracted from the GIMPROD System Availability File. There were three incidents for a total of 42 minutes downtime.

10) OTHER

This subsystem data was extracted from the GIMPROD System Availability File. There were seven incidents for a total of 225 minutes of downtime.

The model utilizes the minimal number of vendors in the systems configuration. The rationale is that failures of an undefined nature results in finger pointing and the added delay in acquiring additional support.

STAT

Attachment:
4 C Projected System Availability (9 March 1981)

4 C PROJECTED SYSTEM AVAILABILITY (09 MAR 1981)
SCHEDULED UP TIME: MON - FRI 0800 -1800

REPORT BY SUBSYSTEM

	SUBSYSTEM	AVAILABILITY	MTBF	MDT	P/C
1	IBM 158 SUBSYSTEM	99.630	627.667	2.333	1
2	MVS	99.825	157.225	0.275	4
3	APP SOFTWARE	99.783	157.158	0.342	4
4	IBM 3330-11 DISK	99.444	626.500	3.500	1
5	COMTEN	99.037	623.933	6.067	1
6	COMMUNICATIONS LINES	98.624	77.667	1.083	8
7	IBM TAPE SUBSYSTEM	99.661	627.867	2.133	1
8	POWER	99.349	625.900	4.100	1
9	PROCEDURAL (OD)	99.889	209.767	0.233	3
10	OTHER	99.405	89.464	0.536	7
	SYSTEM - AVAIL: 94.77	MTBF:	19.723	MDT:	1.088

4 C PROJECTED SYSTEM AVAILABILITY (09 MAR 1981)
SCHEDULED UP TIME: MON - FRI 0800 -1800

REPORT BY CATAGORY

	CATAGORY	AVAILABILITY	SUBSYSTEMS	MTBF	MDT
1	PRIMARY CPU	99.630	1- 1	627.667	2.333
2	O.S. SOFTWARE	99.825	2- 2	157.225	0.275
3	USER SOFTWARE	99.783	3- 3	157.158	0.342
4	DISK	99.444	4- 4	626.500	3.500
5	COMMUNICATIONS	97.661	5- 6	68.363	1.637
6	TAPE SUBSYSTEM	99.661	7- 7	627.867	2.133
7	ENVIRONMENT	99.349	8- 8	625.900	4.100
8	PROCEDURAL	99.889	9- 9	209.767	0.233
9	OTHER	99.405	10-10	89.464	0.536
	SYSTEM - AVAIL: 94.77	MTBF:	19.723	MDT:	1.088